

CLAIMS

1. An optical method for characterization of particulate systems, characterized in that an air flow from the ambient air is guided at a defined speed by a particle feeder past a first scattered light measuring unit and the scattered light is detected, the speed of the particle is then reduced and the particle which is moved at the reduced speed in the air flow is identified in an identification unit by means of interaction with monochromatic light.
2. A method as set forth in claim 1 characterized in that the scattered light measuring unit triggers the optical system of the identification unit by means of a control.
3. A method as set forth in claim 2 characterized in that particles with preselected properties are investigated by means of logical linking of the scattered light measuring unit and the optical system of the identification unit.
4. A method as set forth in one of claims 1 through 3 characterized in that identification of the particles is effected by means of combined laser-Raman spectroscopy.
5. A method as set forth in one of the preceding claims characterized in that the particle is reduced to such a speed that a measuring time of between approximately 1 ms and 1 s is available for the particle.
6. A method as set forth in one of the preceding claims characterized in that the Raman spectra obtained are compared after chemometric analysis with a database and associated.

7. A device for carrying out the method as set forth in one of claims 1 through 6 comprising a particle feeder and an electronic evaluation unit, characterized in that the unit for characterization of particulate systems comprises module units which include at least:

- an optical unit for determining the size and number of particles in an air flow from the ambient air,
- a particle brake,
- an optical identification unit for the moved particles contained in the air flow, comprising corona discharge, excitation laser and spectrometer unit, and
- an electronic control.

8. A device as set forth in claim 7 characterized in that the particle brake is an electromagnetic brake.

9. A device as set forth in claim 7 or claim 8 characterized in that the identification unit includes a narrow-band light source and an NIR multichannel spectrometer.

10. A device as set forth in claim 9 characterized in the light source is a monochromatic light source.

11. A device as set forth in one of claims 7 through 10 characterized in that the spectrometer unit comprises at least one microspectrometer.

12. A device as set forth in claim 11 characterized in that the microspectrometer is arranged in such a way that spectral resolution of at least fifteen wave numbers is achieved.

13. A device as set forth in one of claims 7 through 12 characterized in that the microspectrometer of the optical identification

unit is replaced by other suitable spectroscopic devices in dependence on the particles to be analyzed.

14. A device as set forth in one of claims 7 through 13 characterized in that the control is an electronic control which includes a programmable AD-converter card with integrated processor and an integrated control program.